

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections and objections, and further examination are requested.

Claims 11-24 were pending in this application and stand rejected. Claims 11-16, 23 and 24 have been withdrawn from consideration. Claims 17, 21 and 22 have been objected to. Claims 17-20 and 22 are amended herein, and claim 21 is cancelled herein. Thus, claims 17-20 and 22 are currently pending in this application. No new matter has been added.

The Applicant greatly appreciates the Examiner's indication that claims 20 and 22 contain allowable subject matter and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Applicant has also submitted with this response an Information Disclosure Statement including Form PTO 1449, and respectfully requests that the Examiner consider the references listed therein.

The Applicant acknowledges the Examiner's indication that claims 11-16, 23 and 24 have been withdrawn from consideration because the reply filed on October 10, 2007 was made without traverse. In the Office Action, the Examiner indicated that independent claim 23 was withdrawn from consideration, but did not discuss claim 24. It appears that claim 24 should also have been withdrawn because it depends from claim 23. Thus, the Applicant has indicated that claim 24 is also withdrawn from consideration.

The specification and abstract have been carefully reviewed and revised to make grammatical and idiomatic improvements in order to aid the Examiner in further consideration of the application. Amendments to the specification are contained herein. Moreover, a substitute Abstract including revisions has been prepared and is submitted herewith. Also submitted herewith is a marked-up copy of the Abstract indicating the changes incorporated therein. No new matter has been added.

Claim 22 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claim 22 has been amended herein to address the Examiner's concerns.

Accordingly, the Applicant respectfully requests that the 35 U.S.C. § 112, second paragraph rejection of claim 22 be withdrawn.

Claims 17-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over

Kamiya (U.S. Patent No. 2,988,516) (hereinafter referred to as "Kamiya") in view of Salam (U.S. Patent Application Publication No. 2001/0022495) (hereinafter referred to as "Salam").

Independent claim 17 has been amended to distinguish over the references cited by the Examiner.

The above rejection is submitted to be inapplicable to the amended claims for the following reasons.

Claim 17 recites a light emitting device including a semiconductor light emitting element and a phosphor which is for converting a part of a luminescence spectrum emitted from the semiconductor light emitting element. The luminescence spectrum of the semiconductor light emitting element is located between a near ultraviolet region and a short-wavelength visible region, the semiconductor light emitting element has a main peak in a range from 360nm to 400nm, and the phosphor is represented by a general formula of $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$, where M is at least one selected from the group consisting of Mg, Ca, Ba, and Sr, M' is at least one selected from the group consisting of Mn, Fe, Cr, Sn, $0.0001 \leq x \leq 0.5$, and $0.0001 \leq y \leq 0.5$, and M'' is at least one halogen selected from the group consisting of F, Cl, Br, and I.

Kamiya does not disclose a semiconductor light emitting element in which the phosphor converts a part of a luminescence spectrum emitted from a semiconductor light emitting element that is located between a near ultraviolet region and a short-wavelength visible region, the semiconductor light emitting element having a main peak in a range from 360nm to 400nm, and the phosphor being represented by the formula of $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$. Instead, Kamiya discloses a titanium-activated phosphor represented as $xMgO \cdot yB_2O_3 \cdot zMgF_2$ which is excited with short wave length of ultra-violet wave (see col. 1, lines 9-15), and is for use as a luminescent material in a low pressure mercury discharge lamp which has a peak wavelength of 253.7nm or less. Moreover, there is no disclosure or suggestion in Kamiya to modify the phosphor so it is represented as $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$, to modify the low pressure mercury discharge lamp to have a main peak in a range from 360nm to 400nm, and to convert part of a luminescence spectrum emitted from the low pressure mercury discharge lamp that is located between a near ultraviolet region and a short-wavelength visible region.

In other words, Kamiya does not disclose a light emitting device including a semiconductor light emitting element and a phosphor which is for converting a part of a

luminescence spectrum emitted from the semiconductor light emitting element. Moreover, Kamiya does not disclose the luminescence spectrum of the semiconductor light emitting element being located between a near ultraviolet region and a short-wavelength visible region, the semiconductor light emitting element has a main peak in a range from 360nm to 400nm, and the phosphor is represented by a general formula of $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$, where M is at least one selected from the group consisting of Mg, Ca, Ba, and Sr, M' is at least one selected from the group consisting of Mn, Fe, Cr, Sn, $0.0001 \leq x \leq 0.5$, and $0.0001 \leq y \leq 0.5$, and M'' is at least one halogen selected from the group consisting of F, Cl, Br, and I.

For at least the reasons discussed above, it is believed clear that Kamiya fails to disclose or suggest the present invention as recited in claim 17.

Regarding the combination of Kamiya and Salam, Salam is relied upon in the rejection as disclosing a light emitting device provided with a nitride semiconductor light emitting element, including at least Ga and In/Al, and provided with a fluorescent composition which converts the UV radiation generated by the semiconductor element to a longer wavelength.

Salam discloses a light source 1 that comprises an LED chip 2 mounted on a metal support 3. Over chip 2 there is a cover 4 of transparent dielectric material 4 (see para. [0061]). Chip 2 comprises semiconductor layers 6 and 7 that together constitute semiconductor 8. Moreover, chip 2 has a top surface 24, four outer side faces 25 and several supplemental side faces 26 provided by trenches 14. Light may escape through at least surfaces 24 and 26. Supplemental side faces 26 allow light progressing sideways in semiconductor layers 6, 7 to escape from the chip without having to travel all the way to faces 25. Because the sideways light travels a shorter distance within semiconductor 8 before it escapes, it is attenuated less. This lower light attenuation facilitates making large, bright LED chips (see para. [0073]). Thus, it is clear that Salam also fails to disclose or suggest the above-discussed features of the light emitting device recited in claim 17.

It is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit Salam is incompatible with Kamiya because Salam is directed towards a light source comprising an LED chip 2, while Kamiya is directed towards a phosphor for use as a luminescent material in a low pressure mercury discharge lamp.

The Examiner has taken the position that the combination of Kamiya and Salam would have been considered within the capabilities of one skilled in the art to use the semiconductor light emitting element disclosed by Salam, instead of the fluorescent lamp of Kamiya, in order to obtain a light emitting device having the general advantages provided by a semiconductor light emitting element. However, combining the references as suggested by the Examiner renders Salam unsatisfactory for its intended purpose.

By disposing the phosphor of Kamiya on the semiconductor surfaces 24 and 26 of Salam, the surfaces 24 and 26 become covered such that they do not allow light to escape. Moreover, the light that would escape from surface 26 is not permitted to appear as bright light. Thus, because the LED 2 of Salam would not function as a large, bright LED chip (see para. [0073] of Salam), the proposed combination renders the device of Salam unsatisfactory for its intended purpose. Moreover, because the proposed combination renders the device of Salam unsatisfactory for its intended purpose, Kamiya and Salam are incompatible. Furthermore, it is respectfully submitted that one of ordinary skill in the art would have no reason to combine a phosphor used in a low pressure mercury discharge lamp with a light source comprising an LED because they operate differently on a fundamental level.

For at least the reasons discussed above, it is believed clear that the combination of Kamiya and Salam fails to disclose the present invention as recited in claim 17. Therefore, no obvious modification of Kamiya and Salam would result in or otherwise render obvious the invention recited in claim 17.

Claims 17-19 and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hase et al. (JP 55-043101) (hereinafter referred to as "Hase") in view of Salam.

The above rejection is submitted to be inapplicable to the amended claims for the following reasons.

Claim 17 is recited above.

Hase does not disclose a semiconductor light emitting element and a phosphor which is for converting a part of a luminescence spectrum emitted from the semiconductor light emitting element, wherein the semiconductor light emitting element has a main peak in a range from 360nm to 400 nm and the phosphor is represented by a general formula of $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$.

Instead, Hase discloses a gas discharge emission element comprising an individual gas having a discharge radiation spectrum in a wavelength region shorter than 200nm, the chloroborate fluorescent substance 25 of the formula (MII is an element selected from Be, Mg, Zn, Sn and Pb; MIII is an element selected from Al, Ga, In, Tl, and Bi; $0 \leq X \leq 0.7$; $0.001 \leq Y \leq 0.5$; $0 \leq Z \leq 0.3$), and the discharge electrodes of the anode 22 and the cathode 23 in a container. Moreover, there is no disclosure or suggestion to modify Hase to have a discharge radiation spectrum in a wavelength region larger than 200nm and to represent the phosphor by a general formula of $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$.

In other words, Hase does not disclose a light emitting device including, in part, a semiconductor light emitting element and a phosphor which is for converting a part of a luminescence spectrum emitted from the semiconductor light emitting element. Wherein the luminescence spectrum of the semiconductor light emitting element is located between a near ultraviolet region and a short-wavelength visible region, the semiconductor light emitting element has a main peak in a range from 360nm to 400 nm, and the phosphor is represented by a general formula of $(M_{1-x-y}Eu_xM'_y)_2B_5O_9M''$, where M is at least one selected from the group consisting of Mg, Ca, Ba, and Sr, M' is at least one selected from the group consisting of Mn, Fe, Cr, Sn, $0.0001 \leq x \leq 0.5$, and $0.0001 \leq y \leq 0.5$, and M'' is at least one halogen selected from the group consisting of F, Cl, Br, and I.

It is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit Salam is incompatible with Hase because Salam is directed towards a light source comprising an LED chip 2, while Hase is directed towards a gas discharge emission element comprising an individual gas having a discharge radiation spectrum in a wavelength region shorter than 200nm. Moreover, it is respectfully submitted that one of ordinary skill in the art would have no reason to combine a phosphor used in a low pressure mercury discharge lamp with a light source comprising an LED because they operate differently on a fundamental level.

Because of the above-mentioned distinctions, it is believed clear that claim 17 is patentable over the references relied upon in the rejections. Further, it is submitted that one of ordinary skill in the art would have no reason to modify the applied art in such a manner as to result in, or otherwise render obvious, the invention of claim 17. Therefore, it is respectfully

submitted that claim 17 and claims 18-20 and 22 depending therefrom are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, all of the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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March 13, 2008